

Telemedia *News and Views*

An Executive Briefing On Intelligent Phone Strategies and Voice Technologies

IP Phone Sells Out

The "SOLD OUT" sign was posted in front of the Ritz Carlton Hotel in San Francisco, where the Voice On Network '97 Exposition was underway. Hundreds of industry participants attended three days of presentations on the potential of Internet Protocol-based Telephony ("IP Phone").

The IP Phone business is not yet two years old. First products—telephony browsers—began shipping in the third quarter of 1995. By the end of that year, International Data Corporation (IDC-Framingham, MA) saw 500,000 individuals using the Web to make telephone calls and predicted that the number would reach 16 million by 2000. These projections are ambitious. Yet it is the right time for carriers and Telemedia service providers to hone their IP Phone strategies.

Fat-Free IP

The potential for IP Phone service is HUGE. Yet estimating its size and growth rate is a researcher's nightmare. The basic task is to estimate the speed at which traffic migrates from the public switched telephone network to the Internet.

At the same time, migrating means replacing "fat" long-distance minutes (like international service, which can carry a price tag as high as \$3.00) with "free" minutes. That's because the incremental cost of carrying a voice conversation on the Internet is nil.

Let's say that fat minutes account for 30 percent of the minutes on U.S. long-distance and international networks. That means that IP Phone services have the potential to rob long-distance carriers of about 100 billion minutes of talk-time. At a conservative \$0.23 per minute, they stand to lose about \$230 million each year.

On the other side of the equation, a new breed of carrier, whose prototype is USA Global Link (Fairfield, IA) will discount those minutes by as much as 80 percent. That turns the long-distance industry's quarter of a billion dollar loss into a gain of only \$50 million for upstart telecoms.

What happens to the \$200+ million in annual savings is anybody's guess. If the past is any sort of predictor, companies and individuals will talk more or find more ways to use the phone to suck up the rest of the network's capacity. In spite of steep price incentives, prospective customers are waiting on the sidelines.

Spotlights and Highlights

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The Public Side of IP Phone

Today, largely due to lack of a voice-hardened infrastructure, only a handful of firms specialize in IP Phone over the "public" Internet. In 1996, those companies generated something north of \$15 million from selling "client" software that plug into popular Web Browsers and "server" software which can reside on an Internet Service Provider's dial-up access point or on an "Internet relay chat" (IRC) host.

VocalTec Communications Ltd. (Herzliya, Israel and Northvale, NJ) pioneered development of IP Phone with the introduction of its "Internet Phone" products (I-Phone) in mid-1995. In early 1996, VocalTec went public and closed the year with revenues of \$8.5 million (which could be as much as half of the total market for IP Phone software)

As a start-up in a fast-growing industry, VocalTec is on a path to triple its revenues in 1997. Laying in wait to capture some of that growth is **NetSpeak Corporation** (Boca Raton, FL) with its WebPhone product, **Camelot Corporation** (Dallas, TX) whose Digiphone software remains something of a dark horse, and several other firms.

The strategy of each of these companies is to conform to emerging IP Phone standards, build a large directory of IP Phone users, and cement relationships with well-established teleservicing firms.

VocalTec has developed an "IP Gateway" product that enables PTTs and domestic carriers in Finland, Korea, and New Zealand to offer IP Phone services to their customers. Earlier this year it forged a licensing and distribution relationship with **Motorola Inc.** (Schaumburg, IL) under which a newly chartered division of Motorola will manufacture and distribute the IP Gateway

"firmware" (i.e. printed circuit boards) to telcos and ISPs.

NetSpeak has linked its fortunes with **Rockwell Switching Systems Division** (Rockwell SSD-Wood Dale, IL) to help integrate teleservicing call centers to the World Wide Web using its WebPhone products.

Wan Hol

It is increasingly clear that internal corporate wide area networks (WANs) are better suited for IP Phone systems and services. Corporate users that operate data networks among multiple buildings or offices already operate their own broadband digital networks to connect computers, terminals, telephones, and even voice response units.

In almost every case, internal data networks employ the "Internet Protocol" (IP) for their computer-to-computer communications. That is the same "IP" that supports IP Phone service. The salient differences are that speed and administration. Well managed internal networks are not subjected to the same levels of congestion as the wild, woolly World Wide Web on which "public" IP Phone service tries to piggyback.

What's more, traffic on corporate WANs does not follow the succession of "hops" that leads to delays and lost packets. When potential problems with congestion exist, network administrators find it easier to reserve bandwidth on private networks than they over the shared Internet.

MICOM Communications Corp. (A Nortel Company-Simi Valley CA) is making a considerable amount of hay with a package of firmware called the V/IP Phone/Fax Gateway. "V/IP" means "Voice over the Internet Protocol." Ken Guy, MICOM's Vice President of Corporate Strategy told *TNV* (with considerable enthusiasm) that his company's package of printed circuit boards

and software "delivers toll quality voice over corporate IP networks right here, today, now!"

Guy prefers the term "corporate IP network" over the more widely used "Intranet" because it is more accurate. "The word 'Intranet' means there is a Web browser involved," he explained. By contrast, V/IP delivers dial-tone through the wall to traditional telephones or facsimile machines.

Instead of dialing "9" for an outside line, a caller may dial "6" or some other designated prefix to have the call routed over the corporate IP network. Keeping intracompany phone calls and facsimile traffic "on net" keeps communications costs extremely low.

With prices that start at about \$1,000 per "trunk" and decline with volume to less than \$800, the payback period for such a system is measured in months.

The Telemedia Factor

The effect that V/IP or similar technology will have on the audiotex, interactive voice response, or customer service call center is not immediately obvious. As described thus far, V/IP is more like an Internet-based Virtual Private Network.

However, the word "gateway" in the product name is a tip-off to its full potential. Ken Guy described how one of MICOM's customers, **TexasBank** (Weatherford, TX) uses V/IP to provide toll-free access to the bank's interactive voice response system to provide 24 hour banking.

The bank has a dozen or so branches in the Dallas-Fort Worth Metroplex. High-speed digital communications links [meaning a T-1 span: which is a 1.44 megabit connection that consists of consists of twenty-four 56 Kbps channels plus some overhead] connected all the bank branches to headquarters. Late last year, after acquiring several new branches from a former competitor, the bank re-

evaluated its internal networking strategy. That's when it considered installing V/IP.

Network Administrator Cindy Williamson told *TNV* that the financial arguments for such a solution are "very compelling." However, she and her cohort of evaluators wanted assurance that the quality of voice communications would not be degraded. "For that, I had to hear it," she explained.

The result was a pleasant surprise for Williamson. The system has been up and running for several months now and she still characterizes the voice quality as "awesome."

Returning to her pragmatic network administrator persona Williamson explained how the economics and network engineering work in TexasBank's favor. Before implementing V/IP, she had to "reserve" either four or six of the T-1 channels to handle calls into the bank's IVR system. That left only 18-20 channels for internal data and voice.

Reserving whole channels on T-1 spans is inefficient both because it is rigid (requiring that specific channels be dedicated *either* to voice *or* data) and because it handles voice inefficiently. On T-1 a voice conversation uses 64 Kilobits of bandwidth.

Routing voice through the V/IP gateway means that voice commingles with data on the bank's digital network. No more partitioning the network between voice and data traffic. "When there is no voice, I get the whole T-1," Williamson noted.

Using compressed voice over an IP network actually adds capacity to the bank's WAN because the MICOM's voice compression technique uses only 8 Kilobits of bandwidth to support a voice path. That makes the network much more capacious. This translates into better customer service. For example, loan seekers get quicker answers because room was freed up on the network

to support "centralized credit scoring" which involved too much bandwidth in the past.

The biggest advantage was the \$6,000+ that TexasBank saves on its monthly telephone bill, compared to a solution involving 800 number-based ingress to the banks IVR or live teleservicing agent.

If a "6" Turns out to be "9"

Thanks to their high-speed, persistent, multipoint connectivity corporate WANs are proving grounds for the most elegant deployment of IP Phone technology. Thanks to products like MICOM's V/IP, many corporations are deploying what amounts to "IP VPNs" (where "VPN" is an abbreviation for Virtual Private Network).

Aside from cost savings, the most promising aspect of the virtual VPN approach is that callers do not have to change their behavior. Okay, they have to dial "6" instead of "9" before a dialed number, but that is a small price to pay to pay a small price for sending an internal fax or making a phone call.

From the Telemedia point of view, there are broad ramifications of V/IP that transcend the "intranet vs. extranet" dichotomy. It all starts when customers dial in from the outside through a V/IP "gateway." That's when the power of the Internet as a transport medium for traditional Telemedia applications becomes real.

No need for "plug-ins" to a Web browser. No need to be concerned with "static IP addresses, "net masks" (whatever they are), or Domain Name Servers. No need to press a "Call Me" button on a Home Page.

Don't think banks. Don't think IVR. Think 800 numbers as primary ingress to a marketing or service company's internal network. Then think about customers with ordinary telephones making call to reps or resources on that company's WAN without even realizing it.

The Model is Extensible

Employees, living on the WAN, may have to dial a different digit for internal calls. However, TexasBank's IVR service shows that customers, clients, or account holders don't have to change their behavior at all to reach a "gateway" to the corporate wan. This is the kind of transparent transition that IP Phone marketing people dream about.

One problem. In most cases, this vision is, literally, a "pipe dream." It is predicated on some heavy bullet-proofing efforts by Internet engineers. Those engineers are used to referring to high-speed, broadband Internet links as "fat pipes" because they are resistant to getting clogged by large file transfers or lots of little voice conversations.

By contrast, dial-up connections to the Internet (even as they reach the 56 kilobits per second speeds made possible by ISDN or x2 technologies) are still considered "thin" pipes. MICOM's V/IP works best when it employs fat pipes. Handling traffic that originates from dial-up links into Internet Service Providers (ISPs) requires a little more tweaking.

HO-HO: No Laughing Matter

In the works is an "ISP-PSTN Gateway" which will make Internet Service Providers (ISPs-like UUNet, NetCom, PSI, and others) more viable competitors in the Telemedia business. The acronym that is likely to take hold for this new piece of Internet infrastructure is the "Hop On, Hop Off" Gateway, or HO-HO.

VocalTec's partnerships with domestic carriers in Finland, New Zealand and Korea employ HO-HO. Its deal with Motorola is likely to accelerate HO-HO deployment. The MICOM V/IP is another candidate for ISP-PSTN Gateway employing HO-HO. MICOM is scheduling a roll-out of the product in the 1997-1998 timeframe.

The Politics of IP-PSTN Integration

USA Global Link is not alone in its pursuit of international calling over the Internet. A start-up company based in Israel, **Delta Three** (D3-Jerusalem, Israel and New York, NY), has already launched its own global service using bullet-proofed Internet transport as the basis for telephone-to-telephone conversations priced for a flat \$0.30 per minute.

D3 markets its service in three different packages. Corporate customers can pay a flat \$0.15 for communications through a "D3 Server." It also packages international fax-to-fax and phone-to-phone offered using the equivalent of an Internet calling card.

The service originated as a link between Jerusalem and St. Petersburg, Russia allowing émigrés to make inexpensive telephone calls to family and friends. Delta Three has added several more country pairs as it pursues new markets, carriers and resellers around the world.

Its Web Site (<http://www.deltathree.com>) tells much of the story. Over time, new links were opened among the United States, Canada, Russia, Colombia, Paraguay, Singapore, and soon Britain, France, Japan and Australia.

The domestic market for the D3 network is a different story. Israel's Ministry of Telecommunications refused to give Delta Three permission to conduct a beta trial of its Global network for calls that originate and terminate within Israel's borders.

According to a report in the Israeli newspaper *Ha'aretz* the request was denied because it would contravene [Israel's domestic telephone company] Bezeq's monopoly."

In spite of its domestic setbacks, Delta Three continues to seek partnerships and customers around the world.

Yet Another Airline Analogy

Competition for telecommunications services is heating up on a global scale. Changing regulations and trade agreements have played a big part in the transition. So has growth in awareness of the Internet.

At this point it is easy to draw parallels to the airline industry where "deregulation" in the early 1970s followed the Rule of Unintended Consequences. Competition was supposed to give travelers to more choices and lower prices from a set of leaner, meaner, more responsive carriers.

Instead, airlines had to consolidate to compete. A few name-brand carriers—like Pan Am—fell victim to losses from which they have yet to recover. Surviving carriers have limited the routes they serve and introduced higher, more rigid pricing.

The Internet stands a chance of preventing the Telemedia industry from going the way of the airlines. As a global transport network with very low incremental costs, it has played a big role in changing user perceptions and expectations for telecom services. Users have come to like flat-rate pricing.

New user expectations present domestic and international carriers with some major marketing dilemmas. How do you price new services that your best customers expect to be free? How do you increase market share in an environment where smaller competitors can undercut you? Finally, and perhaps most importantly, doesn't the whole industry get a black eye if carriers fail to deliver the services they promise?

Ken Guy at MICOM believes that a pricing strategy that strongly resembles the one used by airlines will prevail in the HO-HO market. Users who pay a premium will get a first-class seat. They will dial into an ISP through a high-speed link, which serves as the point of ingress for a WAN-like connection. For

them the Internet will behave like a corporate IP network.

There will also be a Business Class equivalent for customers who pay a little less, but have predictable, regular demand for access to fat pipes. This is a category that may be especially important for Telemedia- or Teleservicing-oriented ISPs. They can issue Personal Identification Numbers (PINs) or prepaid Internet calling cards to a selected or self-identifying group of customers or clients.

Finally, there is "coach" class (more accurately steerage). Today, all dial-up users are flying coach. As the "backbone" networks become even more congested the prospects are even more dismal for "real-time" communications like talking on the phone or desktop videoconferencing, as envisaged by Microsoft or Intel.

The solution for *TNV* readers to watch for and support are efforts underway to insure that Internet Phone conversations get first-class or business class treatment on a call-by-call basis. In the argot of the jargon-rich development community, this is "IP-PSTN Interoperability."

**Standards for 1st Class IP Phone
At the International Telecommunications
Union (ITU):**

1. High-quality compressed voice (G.723),
2. Multisite conferencing (H.323),
3. Multimedia messaging (H.245), and
4. Telephone call processing (Q.931).

**At the Internet Engineering Task Force
(IETF):**

1. Real-time communications (RTP/RTCP),
2. Priority queuing (RSVP-the Resource ReserVation Protocol),
3. Addressing (Lightweight Directory Access Protocol-LDAP)

The IP Phone Landscape

What follows in this issue of *TNV* is a quick survey, noting different approaches to IP Phone by firms leveraging their pieces of the IP infrastructure. In addition to MICOM (and its parent Nortel), initiatives by Sun Microsystems, Microsoft, MCI, and Ronald A. Katz Technology Licensing, L.P. figure prominently in the development equation.

Scotty and the "WebTones"

Let's start with Sun Microsystems, Inc. (Menlo Park, CA). It is behaving like the quintessential firm that gets it. Last month it unveiled the concept of "WebTone," making Internet connectivity the overall guiding principle for both its "software strategy and product focus for the remainder of the decade."

In remarks at an all-day press conference on April 15, Sun's Chairman, President and CEO, Scott McNealy, compared WebTone to the public switched telephone network's dialtone. "In today's world, people pick-up a phone, hear a dial tone, then communicate instantaneously with others around the world."

Janpieter Scheerder, President of SunSoft (Sun's software-only subsidiary) reinforced McNealy's theme by presenting details about how WebTone will permeate devices that range "from smartcards to supercomputers."

Sun expects WebTone to embody three defining characteristics:

1. Like dialtone, it will always be there.
2. It will provide services to businesses and consumers through the Web-based network.
3. It will be accessible from any device (i.e. phones, kiosks, PDAs), anywhere, anytime.

CERTIFICATE OF SERVICE

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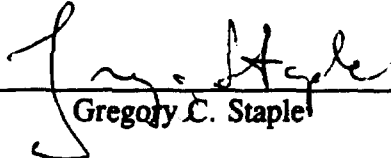
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